The above statement of the general principles which obtain in forecasting for the Pacific coast, are in close accord with the conception of the problem as presented in this paper.

RECORD-BREAKING RAINFALL IN JAMAICA IN JANUARY, FEBRUARY, AND MARCH, 1921.

(Excerpts from *Jamaica Weather Report*, Feb. and Mar., 1921, p. 4.)

The mean rainfall for the entire Island during February was somewhat over twice the normal. Moore Town, in Portland Parish, had a total fall of 27.73 inches during the month, while at Belvedere, in the same parish, there was a 24-hour fall of 9.05 inches. The average precipitation for the Island was 7.22 inches—the greatest amount for any February in 50 years. It is worth noting that the average rainfall for January of this year was 10.87 inches, being the greatest of any January on record. The rainfall for March was 84 per cent above normal.—*H. L.*

APPLIED CLIMATOLOGY IN CALIFORNIA.

551.58(794)

By ANDREW H. PALMER, Meteorologist.

[Weather Bureau Office, San Francisco, Calif., May 17, 1921.]

SYNOPSIS.

The work done at a climatological section center of the Weather Bureau furnishes good evidence of the many and varied applications of climatology. These are not known to the general public, and even professional meteorologists have but a limited appreciation of their extent and variety. The practical applications of climatology in California are here briefly enumerated and described in the hope that the survey may be of interest and perhaps of value in other climatological sections, and with a desire that it may inspire similar surveys of other regions. In California the Weather Bureau acts as a meteorological and climatological center of information and clearing house, and supervises the gathering and publication of a small fraction of the data available. Municipalities, industries, public service corporations, business houses, resorts and institutions maintain climatological stations and secure data which are of great practical value in agriculture, manufacture, industry, mining, transportation, aviation, conservation, public service, advertising, public health and recreation.

INTRODUCTION.

Because of its vast size, its wide range of latitude, its uneven topography and the contrasts of climate which result therefrom, California presents great variety in the uses and applications of climatology, a variety which is probably not equaled by any other State. The following is a brief survey of applied climatology in California, a field which is so extensive that only the salient features can be here referred to.

WEATHER BUREAU ACTIVITIES.

Practically all of the meteorological and climatological activities of the United States Government in California are conducted by the Weather Bureau. While this is the largest single organization engaged in the task of accumulating meteorological and climatological data and making the same available for public use, its activities represent only a small fraction of the total work of this kind carried on in this State. The Weather Bureau serves as a meteorological and climatological clearing house. But the demands for detailed data are so extensive, and these demands are increasing so rapidly that the limited appropriations allowed the Weather Bureau do not permit it to render as complete service as might be rendered with more liberal appropriations.

Briefly stated, the Weather Bureau maintains 11 regular first-class stations, situated at the following places: San Francisco, Los Angeles, Sacramento, Fresno, San Diego, Eureka, Red Bluff, San Jose, San Luis Obispo, Independence, and Point Reyes. The first named is the district forecast center and the climatological section center. Special attention is paid to river and flood data at Sacramento, Fresno, and Eureka. Marine vessel movements are reported at Point Reyes. Storm warning stations are located at eight prominent points along the coast. In addition, approximately 300 climatological substations are maintained, but the observers at only about 10 per cent of these receive nominal compensation (because of special observations and service required), the others being volunteer and unpaid cooperative observers. At all stations special attention is paid to precipitation data, since precipitation is the most important element of climate in California. The Weather Bureau has the cordial cooperation of all the various agencies engaged in gathering weather data, but the extent of the cooperation varies, since the Bureau is unable to supervise the gathering and the publication of more than a small fraction of the data available.

MUNICIPAL CLIMATOLOGY.

The municipal governments of two cities, Oakland and Santa Barbara, have installed the complete meteorological equipment of a first-class Weather Bureau station, including the triple register. In Oakland the apparatus forms part of the equipment of Chabot Observatory, a suburban observatory which is maintained under the auspices of the board of education and is open to public inspection during certain hours. It is a combined meteorological and astronomical observatory, ideally and permanently located on a large tract of land at the edge of the city. At Santa Barbara the municipality has installed complete meteorological apparatus on the grounds surrounding the home of one of its prominent residents. More than $1,000 has been expended in standard equipment with the hope that the Weather Bureau may eventually take over the same and maintain a first-class station at this place.

The city of San Francisco is at present building an aqueduct which will eventually bring water to the city from the Hetch Hetchy Valley, almost 200 miles distant. Since climate and particularly precipitation is an important factor in construction, water supply and hydroelectric power, the municipality maintains two weather stations in the drainage basin, namely, at Hetch Hetchy and Lake Eleanor.

Likewise, the city of Los Angeles, whose aqueduct is complete and in operation, maintains several climatological stations along its route, notably at Fairmont and in the Owens Valley.

The city of San Diego also maintains such a station at Barrett Dam, a link in its water supply system.

The city of Vallejo, the municipality adjoining the United States Navy Yard at Mare Island, has recently installed 36 standard 8-inch rain gages in an elevated valley which it proposes to use as a drainage basin for its future water supply, if the precipitation there comes up to expectations.

A number of communities maintain climatological stations under the supervision of a city official, usually